

REMARKS

The Examiner is thanked for the Official Action of March 22nd, 2007. This request for reconsideration is intended to be fully responsive thereto.

REJECTION UNDER 35 USC § 103(a)

The Examiner has rejected Claims 5-10 and 12-13 under 35 USC 103(a) as being unpatentable over U.S. Pub. 2002/017869 to Kudo in view of US7049031 to Johnson et al. The Examiner rejected Claims 5 and 9 saying that Kudo teaches a lithium rechargeable battery comprising a current collector, a conductor-mixed electrode active material, including a mixture of acetylene black conductive material obtained by a ball mill without a binder, where the electrode active material is coated on the current collector. Applicant disagrees for the following reasons. However, for clarification purpose and for clearly distinguishing the difference between the present invention and the cited prior arts, Applicant amended Claim 5 to read "...a conductor-mixed electrode active material...a conductive material obtained by use of a ball mill without using a binder and without forming carbon layers... No new matter has been added.

Kudo has to do with an electrochemical device comprising a composite of a particulate conductive material and a metal oxide. The abstract of Kudo states that the electrode can be produced without any binder and provides the electrochemical device with good output characteristics. Kudo achieved this result by heating a mixture of a colloidal solution of an oxide of an element and a particulate conductive material.
(Paragraph [0007] of Kudo)

As is described in Kudo, the amount of carbon can be increased to improve the bonding effect, so as to effectively attach the carbon on the particulates by rubbing the carbon and the active material between the surfaces. Kudo increases the carbon as heat-treating the colloidal solution. However, increasing the amount of carbon causes the carbon layer to inhibit the battery reaction which reduces the battery performance.

In addition, in Kudo, there is no definition as to what constitute “good output characteristics”. Reduction of electric resistance due to the metal colloid and carbon does not totally eliminate the chance of inhibiting the cell reaction, at least because of the difference between the material of single carbon bonding and the material employing metal therein.

The configuration of this invention is intended to eliminate the above-problem by employing a point contact rather than a line contact of carbon layer. The ball mill of the present invention gives the point contact between the bonding surfaces, and no multiple carbon layers are created. In this way, there will be no portion on the reaction surfaces that inhibit ion migration, which is extremely important for high output.

Furthermore, the ball mill improves the electrode density during the coating and dispersibility of the mix as compressing the electronic pass of the positive electrode material surface and conductive material by treating the entire electrode composition to be coated.

No cited reference, i.e., Kudo and US. Pub. 2002/017869 to Johnson et al., teaches or suggests the use of ball mill with gives the point contact between the bonding surfaces.

Conclusion

Accordingly, it is submitted that Claim 5-10, 12, and 13 define the invention over the prior art and notice to this effect is respectfully solicited. Applicant has effectively argued against the Examiner's rejections and believes that all currently pending claims are now in condition for allowance. No new matter has been added.

Should the examiner believe further discussion regarding the above claimed language would expedite prosecution he is invited to contact the undersigned at the number listed below.

Respectfully submitted,

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